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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/729,808	12/05/2003	Christopher J. Corbett	223568	1941

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EXAMINER	
DAGOSTA, STEPHEN M	
ART UNIT	**PAPER NUMBER**
2683	

DATE MAILED: 10/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/729,808	CORBETT ET AL.	
	Examiner	Art Unit	
	Stephen M. D'Agosta	2683	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 December 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Preliminary Amendment

The preliminary amendment, which changes the application title, is acknowledged.

Drawings

Figures 1-3 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-18 rejected under 35 U.S.C. 103(a) as being unpatentable over Bommaiah et al. AmRoute Internet Draft 1998, and further in view of English US 6,757,553, Trompower US 5,924,040 and Proctor Jr. US 2003/0048770.

As per **claims 1, 5, 8, 12 and 15,** Bommaiah teaches a method for adding nodes to a wireless mesh network (see paragraph 4.3 to 4.3.1 which teaches creating/joining a mesh group network), the method comprising:

transmitting a query AND if the response is received within a predetermined time period, receiving a response to the query from a responding wireless node; and adding the responding wireless node to the mesh network (paragraph 4.3.1 teaches:

"JOIN-REQ Broadcast:
To create a mesh encompassing all the members (senders or receivers) of a specific group, mechanisms are needed to allow members to discover each other. The expanding ring search mechanism based on TTL-limited broadcasts is adopted. All core nodes periodically broadcast JOIN-REQ messages. The period between JOIN-REQ will be proportional to the TTL value associated with the last JOIN-REQ message.
Each member begins by identifying itself to be the core of a l-node mesh consisting of only itself. The core node sends out JOIN-REQ packets with increasing TTL to discover other members of the group. When a member (core or non-core) node receives a JOIN-REQ from a core for a different mesh for the same group, the node responds back with a JOIN-ACK. A new bi-directional tunnel is established between the core and the responding node of the other mesh. As a consequence of mesh mergers, a mesh will have multiple cores. One of the cores will emerge as the "winning" core of the unified mesh as a result of the core resolution algorithm...");

but is silent on

adjusting an antenna sensitivity pattern of one or more nodes in the wireless mesh network to exhibit spatial selectivity.

The ability to steer an antenna for better reception, interference rejection, etc. is well known in the art. **Proctor** teaches a method to detect signals using an adaptive antenna in a peer-to-peer network (title) whereby the antenna is initially an omni but is then stepped through a sequence of directional angles to find a direction of maximum signal strength (P#39, abstract, figure 3). Further to this point, **English** teaches a beam sweeping method using rotating antenna (title, abstract, figures 1b and 4 and C4, L4-63). From a different perspective, **Trompower** uses both power and antenna steering to determine a location of a mobile since these two features will allow the antenna to cover different locations (eg. via steering) as well as different distances (eg. via power) [see figure 2 and C8, L25-60].

With further regard to claim 5, Bommaiah teaches a method for supporting data connections between three or more wireless devices (see above) which encompasses a first device communicating with one or more devices (and reads on the claim, ie. the method comprising: adjusting the sensitivity pattern of an antenna on a

first wireless device; communicating with a second wireless device AND a third or more wireless devices). Bommaiah's figure 1 clearly shows a first device communicating with a second wireless device and being able to communicate with a third (or more) device(s) **but is silent on** further adjusting the sensitivity pattern of the antenna on the first wireless device to enable communication with a third (or more) device(s). Proctor, English and Trompower (see above) teach using antenna pattern/steering to enable a wireless device to locate other devices and communicate with them.

With further regard to claim 8, Bommaiah teaches wireless devices configured to operate in a wireless mesh network **but is silent on** the wireless device comprising: a processor; a memory coupled to the processor; a module operable via the processor, the module configured to adjust an antenna sensitivity pattern of the wireless device to exhibit spatial selectivity; a transmitter configured to transmit a query; and a receiver configured to determine whether a response to the query is received in a predetermined time period and to add and responding wireless device to the mesh network.

Proctor, English and Trompower (see above) teach using wireless devices/base stations/access points to enable a wireless device to locate other devices and communicate with them. These wireless devices/base stations/access points inherently comprise processors, memory and control systems to adjust antenna patterns to exhibit spatial selectivity, transmit queries and add devices that respond to said queries.

With further regard to claims 12 and 15, Bommaiah teaches wireless devices that can join a mesh communications network and inherently comprise a computer readable medium having computer-executable instructions to perform acts for supporting data connections between three or more wireless devices (see above) **but is silent on** the acts comprising: adjusting the sensitivity pattern of an antenna on a first wireless device; communicating with a second wireless device; and further adjusting the sensitivity pattern of the antenna on the first wireless device to enable communication with a third or more wireless devices.

Proctor, English and Trompower (see above) teach using wireless devices/base stations/access points to enable a wireless device to locate other devices and communicate with them. These wireless devices/base stations/access points inherently

comprise processors and memory to store computer readable instructions/software to control systems that adjust antenna patterns to exhibit spatial selectivity, transmit queries and add devices that respond to said queries.

It would have been obvious to one skilled in the art at the time of the invention to modify Bommaiah, such that it adjusts an antenna sensitivity pattern of one or more nodes in the wireless mesh network to exhibit spatial selectivity, to provide means for using directional beams to extend coverage area(s) for the LAN so as to include users who would not be with-in range of an omni antenna.

As per **claims 2, 6, 9, 13 and 16,** Bommaiah teaches claim 1/5/8/12/15 **but is silent on** further comprising adjusting the transmission pattern one or more times to enable the antenna sensitivity pattern to cover a predetermined spatial area.

The applicant admits in their specification:

(P#39) One method by which the range of a wireless node can be extended is through the use of directional antennas. It is well known in the art that antennas can be designed which favorably transmit signals in a given direction at the expense of other directions. When such an antenna is employed, the transmitted power is concentrated in a given direction and the range of the transmission in this favored direction is extended, while in directions other than the favored direction the range is reduced. It can also be shown that the advantage in transmit range is identically realized when receiving signals. This property of antennas is known as reciprocity.

(P#40) Turning to Figure 3, a wireless node is shown with two antenna sensitivity patterns. Antenna sensitivity pattern 304 radiated power equally in all directions and is referred to omni directional. Antenna sensitivity pattern 306 has a much narrower transmission pattern but increased range in the direction in which the antenna sensitivity pattern is pointed. The width of the sensitivity pattern is known as the beam width. It is well known in the art of antenna design that range and beam width always have a reciprocal relationship.

Trompower uses both power and antenna steering to determine a location of a mobile since these two features will allow the antenna to cover different locations (eg. via steering) as well as different distances (eg. via power) [see figure 2 and C8, L25-60]. The pattern changes as the power is increased/decreased (eg. the coverage pattern changes).

It would have been obvious to one skilled in the art at the time of the invention to modify Bommaiah, such that adjusting the transmission pattern one or more times to enable the antenna sensitivity pattern to cover a predetermined spatial area, to provide means for "searching" for users with different antenna patterns/ranges so as to find as many users to connect to within the RF limitations of the antenna.

As per **claims 3, 10 and 17,** Bommaiah teaches claim 1/8/15 wherein the predetermined time period is fixed (paragraph 4.3.1 teaches:

"To create a mesh encompassing all the members (senders or receivers) of a specific group, mechanisms are needed to allow members to discover each other. The expanding ring search mechanism based on TTL-limited broadcasts is adopted. A11 core nodes periodically broadcast JOIN-REQ messages. The period between JOIN-REQ will be proportional to the TTL value associated with the last JOIN-REQ message.

Each member begins by identifying itself to be the core of a l-node mesh consisting of only itself. The core node sends out JOIN-REQ packets with increasing TTL to discover other members of the group.."

The examiner notes that the Time To Live (TTL) is a "predetermined amount of time" for which an answer is required to be returned.

As per **claims 4, 7, 11, 14 and 18,** Bommaiah teaches claim 1/5/8/15 **but is silent on** wherein two or more nodes in the wireless mesh network adjust the antenna sensitivity pattern in a coordinated manner.

The examiner interprets the teachings of both English and Trompower as applying to all nodes/BTS's/Access Points in their respective networks (although their diagrams only show the sensitivity patterns changing for one node). Hence the examiner interprets all the nodes/BTS's/Access Points in the network to exhibit antenna sensitivity pattern adjustment(s).

It would have been obvious to one skilled in the art at the time of the invention to modify Bommaiah, such that wherein two or more nodes in the wireless mesh network adjust the antenna sensitivity pattern in a coordinated manner, to provide means for each node/BTS/AP to coordinate with other nearby nodes/BTS's/AP's so that the most optimal node is selected to support a new user being added to the wLAN.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

1. Harbin et al. US 5,488,737
2. Kagan et al. US 6,850,502
3. Ochi et al. US 2004/0106436
4. Thomas US 6,498,939
5. Hood III US 6,778,844
6. El Batt US 2003/0152086
7. Hsu et al. US 2004/0063438
8. Lohman et al. US 2003/0083104
9. Borras et al. US 5,303,240
10. Meyer et al. US 6,236,866
11. Molnar et al. US 6,694,154

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen M. D'Agosta whose telephone number is 571-272-7862. The examiner can normally be reached on M-F, 8am to 5pm.
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Trost can be reached on 571-272-7872. The fax phone number for the organization where this application or proceeding is assigned is ***571-272-8300***.
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Stephen D'Agosta
8-29-2005